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(56) Documents Cited  
**GB 2345340 A** **GB 2269669 A**  
**WO 1990/001160 A1** **US 4742708 A**

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(54) Abstract Title  
**Testing gas detectors**

(57) Gas detectors e.g. CO type, are tested with a device comprising a resilient, deformable sealing portion 20 with a sealing lip 14 typically having a skirt 12, where in use the lip is pressed against a surface of the detector or the surface of a wall or ceiling on which the detector is mounted. The lip when positioned on or over the detector defines a gas tight volume to which testing gas is supplied. The device may have a window 32 to observe the detector during testing.

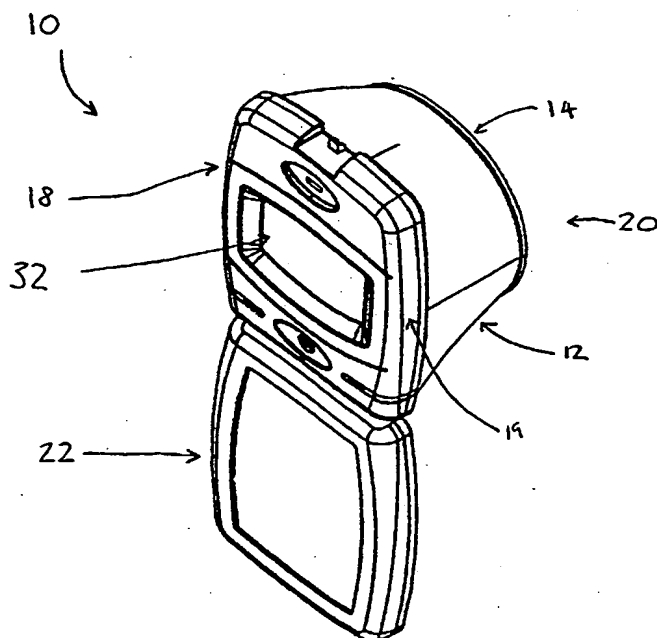


Fig. 1

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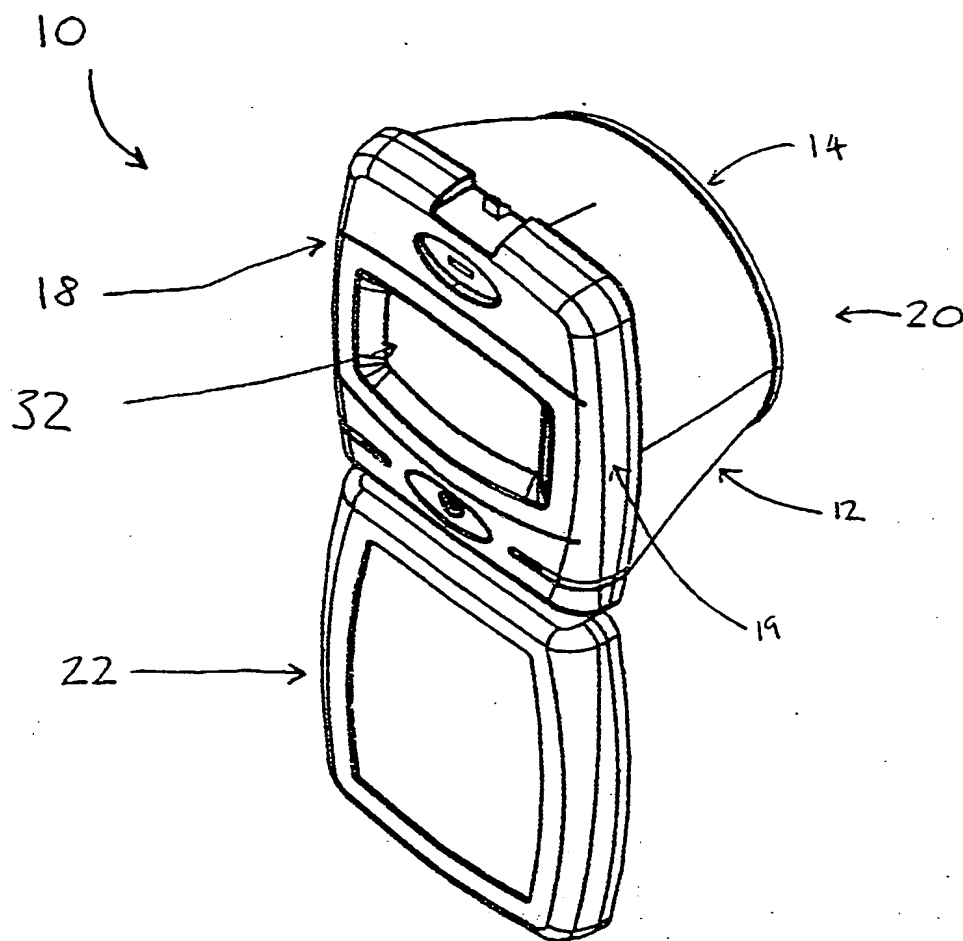


Fig. 1

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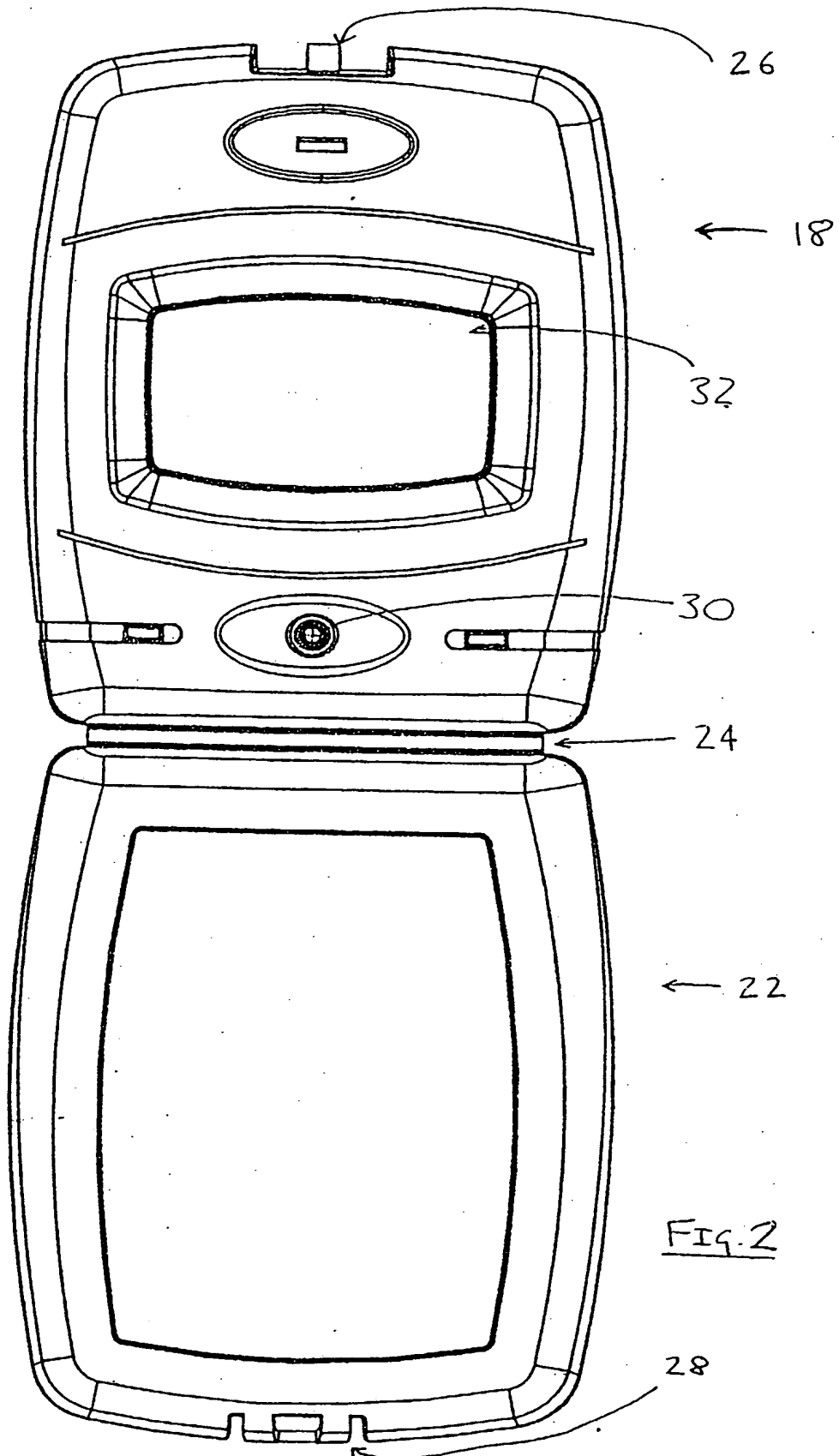
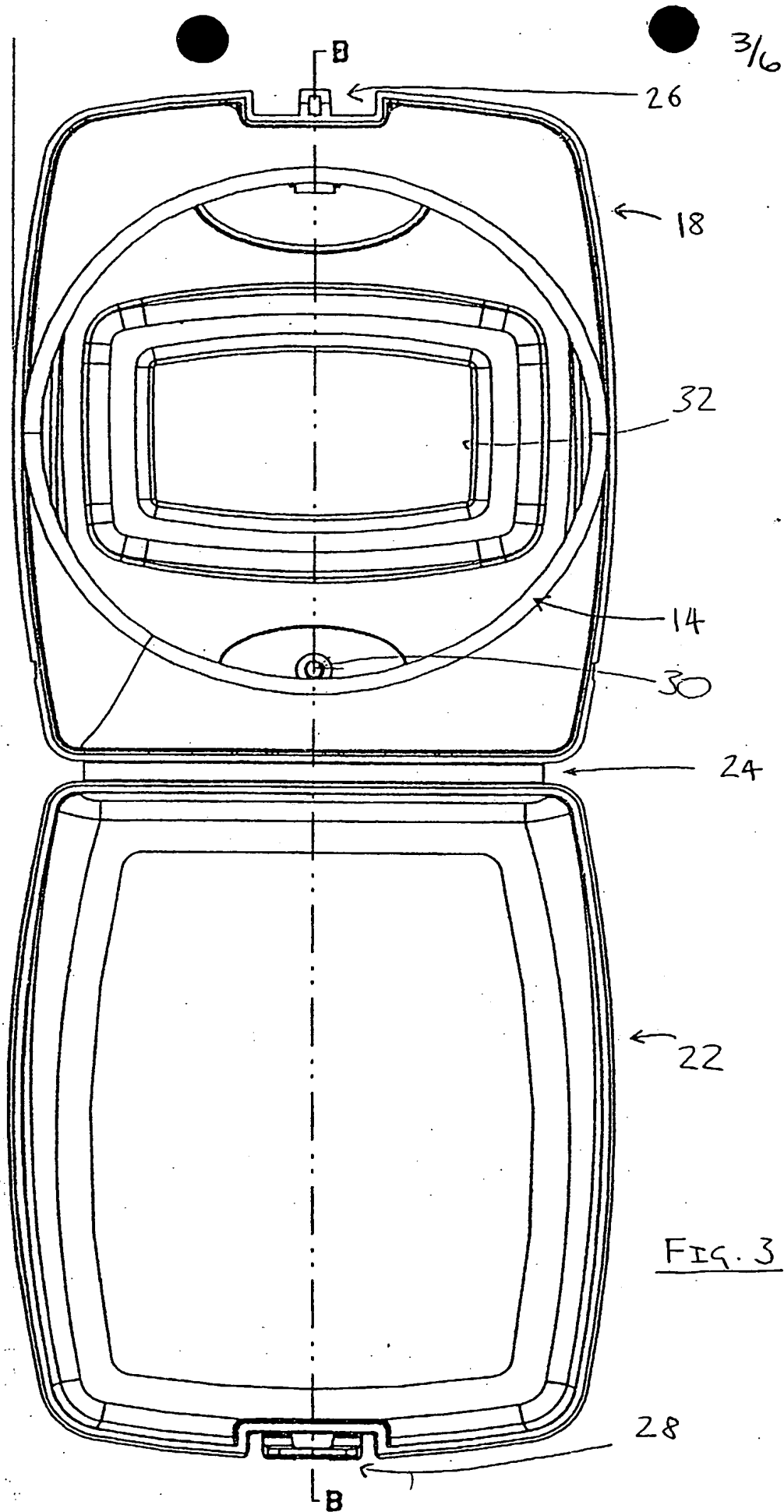


Fig. 2



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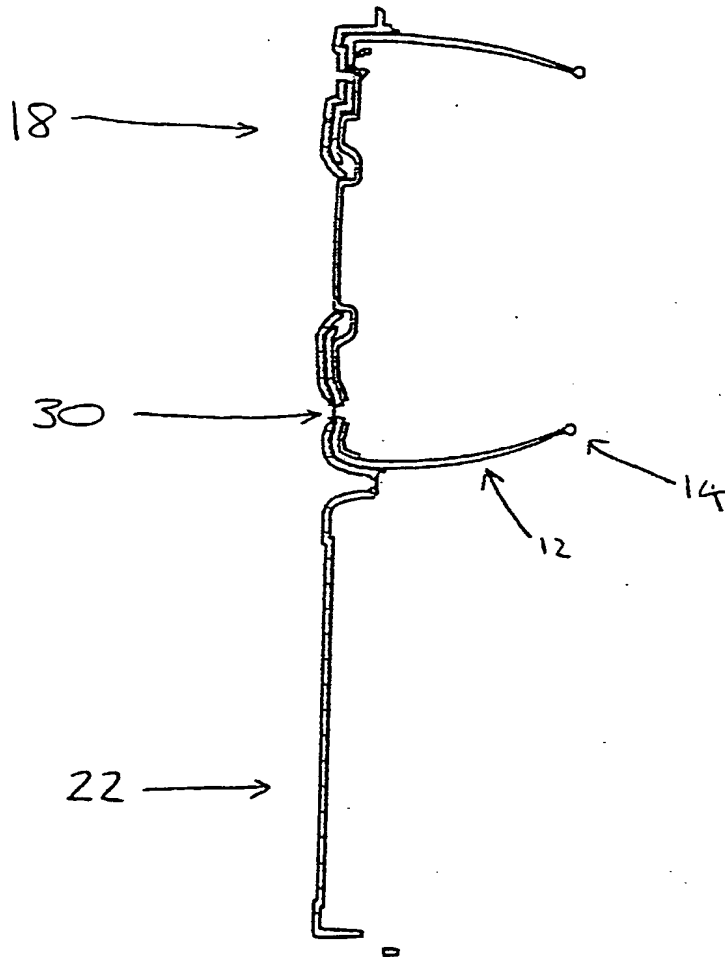


FIG. 4

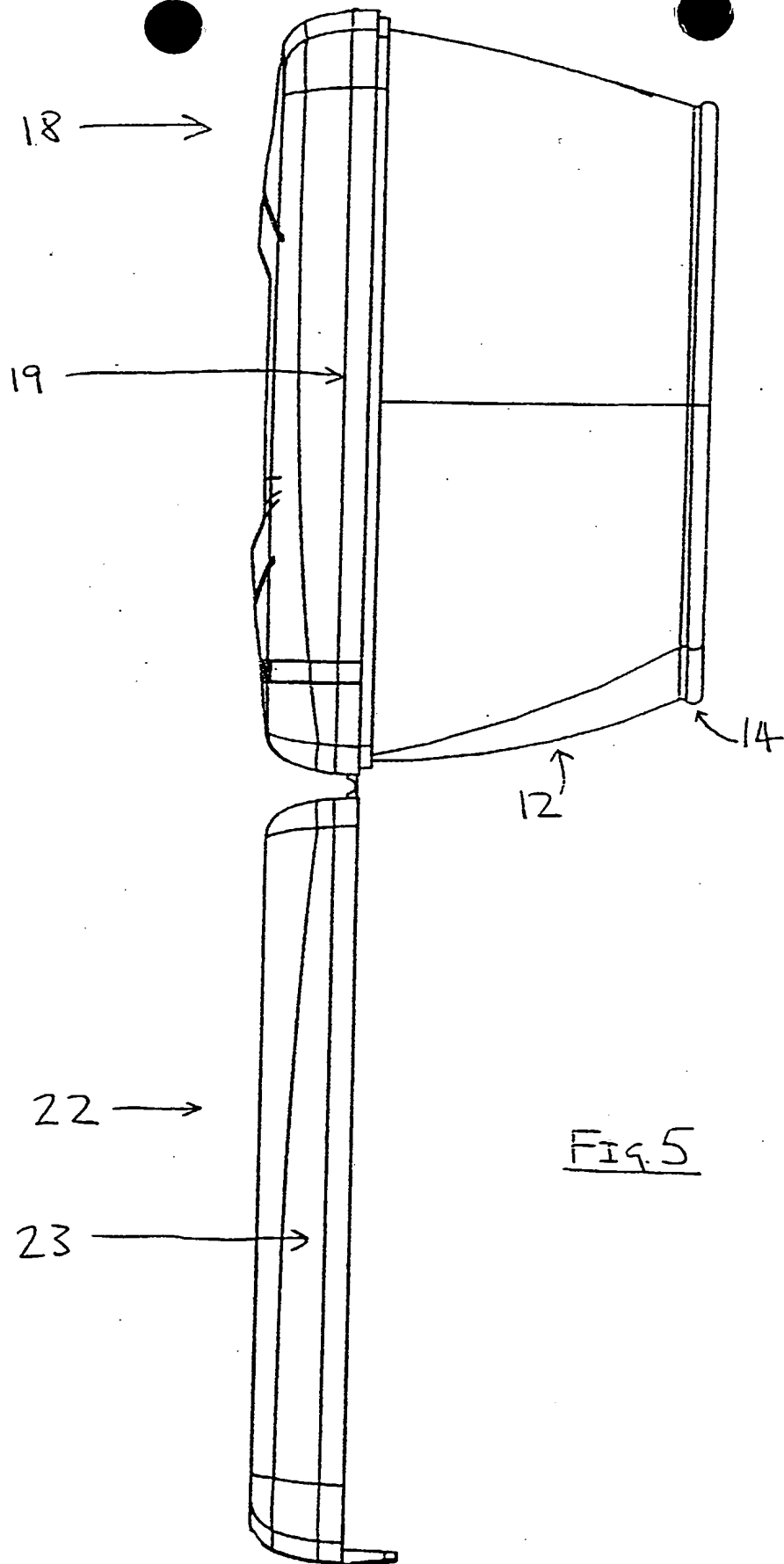


Fig. 5

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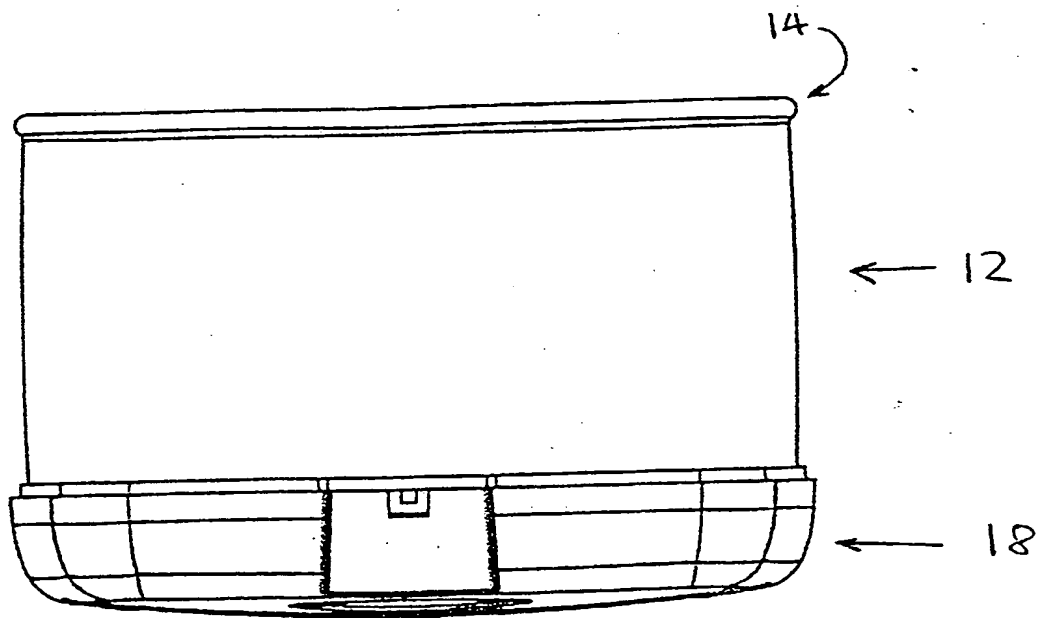


FIG. 6

GAS DETECTOR TESTING ACCESSORY

The present invention relates to accessories for testing gas detectors.

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Gas detectors, for example detectors for detecting the presence of carbon monoxide, utilise sensors to detect a particular gas. The sensors have a limited life time (typically around five years) and so there is a need to test gas detectors periodically to ensure continuing satisfactory operation.

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Gas detectors are typically manufactured incorporating microprocessors which cycle test the air in the detector over a predetermined time. If a dangerous gas concentration is detected over the predetermined time, an alarm is triggered.

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The predetermined time for this cycle testing is chosen so as to try to avoid false alarms. To test a gas detector using a test gas, the test gas must be maintained around the detector over the test period.

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There is a need for an accessory for testing gas detectors to maintain a test gas around a gas detector for the required time.

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Accordingly, in a first aspect, the present invention provides a gas detector testing accessory having a resilient, deformable sealing portion with a sealing lip defining an opening in the sealing portion, in use, the sealing lip being pressable against a surface

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so that the sealing portion and the surface surround a testing volume which is substantially enclosed.

Typically, the surface is a surface of a gas  
5 detector or is a surface on or in which a gas detector is mounted.

Preferably, the sealing portion is arranged on a support portion. In use, the sealing portion may then be  
10 manoeuvred by manoeuvring the support portion. Typically, the support portion is more rigid than the sealing portion.

Preferably, the opening in the sealing portion is  
15 resiliently enlargeable. This allows the accessory to be used with gas detectors of different dimensions.

Typically, in a first configuration, the sealing portion stands up resiliently from the support portion.  
20 The sealing portion may be biased towards the first configuration. Preferably, the sealing portion is sufficiently resilient to allow the sealing lip to be pressed against the surface by urging the support portion towards the surface.

25

The support portion may have a window through which light is transmittable. This allows a user to detect a visible indication from a gas detector which is being tested.

30

The support portion may have a test gas introduction aperture. This is an aperture to allow a test gas to be

introduced into the volume substantially enclosed by the sealing portion and the surface. Typically, the aperture includes valve means. The valve means may be a slit in a resilient material. Furthermore, it may be a cross-slit  
5 in a resilient material.

Preferably, the accessory has a closure portion which is releasably securable to the support portion by releasably securable means to enclose the sealing portion  
10 between the support portion and the closure portion. Typically, the sealing portion is in a second configuration when it is enclosed between the support portion and the closure portion. On opening the closure portion from the support portion, the sealing portion is  
15 capable of resiliently springing from the second configuration to the first configuration.

In a second aspect, the present invention provides a gas detector testing accessory having a sealing portion  
20 with a sealing lip defining an opening in the sealing portion, the sealing portion being arranged on a support portion, the support portion having a test gas introduction aperture with resilient sealing means for prevention of substantial gas flow through the aperture,  
25 in use, the sealing lip being pressable against a surface so that the sealing portion, the support portion and the surface surround a testing volume which is substantially enclosed. Preferably, the resilient sealing means prevents unwanted gas flow through the aperture.  
30 Typically, a user may introduce gas through the test gas introduction aperture by using test gas introduction

means. The test gas introduction means may, for example, include a straw or pipe or similar means.

Preferably, the resilient sealing means includes a  
5 resilient material with a slit therein, the slit being resiliently biased towards a closed position. More preferably, the resilient material may have a second slit therein, the two slits being arranged to form a cross-slit arrangement, for example.

10 In a third aspect, the present invention provides a gas detector testing accessory according to the second aspect, including any of the features described with respect to the first aspect.

15 In a fourth aspect, the present invention provides a gas detector testing kit having a container containing a test gas and an accessory according to the first aspect.

20 In a fifth aspect, the present invention provides a method of testing a gas detector using an accessory according to the first aspect, the method having the steps of:

25 (i) holding the sealing lip to a surface associated with the gas detector so that the sealing portion and the surface surround a testing volume which is substantially enclosed, and

30 (ii) introducing a test gas into the testing volume to test the detector.

An embodiment of the present invention will now be described in detail, by way of example only, with

reference to the accompanying drawings, in which:

Fig. 1 shows a schematic perspective view of an accessory according to an embodiment of the invention;

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Fig. 2 shows a schematic front view of the accessory of Fig. 1;

Fig. 3 shows a schematic rear view of the accessory according to Fig. 1;

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Fig. 4 shows a schematic cross-sectional view along line B-B in Fig. 3;

Fig. 5 shows a schematic side view of an accessory according to Fig. 1; and

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Fig. 6 shows a schematic top view of an accessory according to Fig. 1.

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The drawings use consistent reference numerals. Therefore, references to particular features in one drawing may also be applicable to other drawings.

Fig. 1 shows a schematic view of a gas detector testing accessory 10. The accessory has a sealing portion 20 arranged on a support portion 18. The sealing portion 20 includes a skirt 12 and a lip 14. The sealing portion 20 is elastomeric and is made from neoprene. The sealing portion is flexible and resilient. In contrast the support portion is relatively rigid and is made from polypropylene.

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The support portion 18 is of approximately square shape with rounded corners. The support portion has a depth provided by side walls 19.

5

In a first configuration, the skirt 12 stands proud from the support portion 18, as shown in the figures. The skirt is formed so that it is resiliently biased towards this configuration. In this configuration, the skirt has an approximately circular cross-sectional shape, as shown in Fig. 3.

The accessory also has a closure portion 22. The closure portion 22 is of a similar general shape to that of the support portion 18. It has some depth provided by side walls 23. The closure portion is made from the same material as the support portion, i.e. polypropylene. Typically, the closure portion and the support portion are formed together by injection moulding of polypropylene.

20

The closure portion 22 is attached to the support portion by a hinge 24 (shown in Fig. 2). The hinge is a "living hinge", integral with the support portion 18 and the closure portion 22, but made thinner than the walls of the support portion and closure portion to give it the required flexibility to act as a hinge.

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The support portion 18 has releasable attachment means 26 disposed at the opposite end of the support portion 18 to the hinge 24. The closure portion 22 has correspondingly shaped means 28 disposed at the end of

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the closure portion 22 away from the hinge 24. Means 26 and 28 are shaped to allow the support portion 18 and the closure portion 22 to be releasably secured together, thereby enclosing the sealing portion 20 between the support portion 18 and the closure portion 22. The attachment means 26, 28 can attach to each other by a latching arrangement, for example.

When the sealing portion 20 is enclosed between the support portion 18 and the closure portion 22, the sealing portion 20 is deformed away from its first configuration into a second configuration. In this second configuration, the sealing portion is compressed and/or folded to fit between the support and closure portions. Consequently, when the accessory is opened, i.e. when the means 26 and 28 are released from each other, the sealing portion 20 springs back into its first configuration to stand proud from the support portion 18.

In use, the sealing portion 20 is, at least initially, in its first configuration. The lip 14 is pressed to a surface of a gas detector (not shown). Typically, the gas detector is mounted in a building, for example on a wall, ceiling or other surface. The lip 14 should surround all of the detection apertures on the gas detector. If required, the lip 14 may be stretched to fit large gas detectors. Alternatively, for smaller gas detectors, the lip 14 may be pressed against the wall or ceiling around the detector to which the detector is mounted. The aim here is to form a substantially enclosed volume around the sensors in the gas detector. The seal formed need not necessarily be completely gas-

tight, but should be satisfactory to maintain a gas around the detector for the required time.

5 Since the sealing portion is resistant and the support portion is rigid, the sealing portion may be pressed to the gas detector by a user holding only the support portion. This is advantageous since the user can perform this operation one-handed.

10 Once the lip, and hence the sealing portion 20, is positioned on or over a gas detector, the surface of the gas detector, the sealing portion 20 and the support portion 18 define a volume which is gas-tight enough for the purposes of testing the gas detector. Test gas is  
15 introduced into that volume through aperture 30 in the support portion 18. Aperture 30 is an aperture formed in the support portion 18. It coincides with a cross-slit in the resilient material of the sealing portion 20. The cross slit prevents substantial amounts of the test gas  
20 escaping from the test volume through the aperture 30.

The support portion 18 has a transparent or translucent window disposed approximately centrally. A user can observe a gas detector through the window 32  
25 during testing of the gas detector. Typically, gas detectors give a visual indication of an alarm state. Thus, a user can test the gas detector and observe this visual indication to see whether the sensor in the gas detector is operating satisfactorily.

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After testing, the sealing portion 20 is removed from the gas detector. For storage and to

prevent ripping or tearing of the sealing portion during storage, the sealing portion 20 is enclosed between the support portion 18 and closure portion 22 by fastening the releasable attachment means 26, 28 together. Since  
5 the diameter of the skirt 12 is significantly less than the length and width of the support and cover portions, the sealing portion folds easily between the support and cover portions.

10                Modifications of this embodiment and further embodiments which are within the scope of the invention will be obvious to the person skilled in the art. In particular, it should be noted that it is not necessary to have a closure portion for the accessory to perform  
15 its function. The closure portion 22 is provided for storage of the sealing portion 20 when the accessory is not in use.



CLAIMS

- 5 1. A gas detector testing accessory having a resilient,  
deformable sealing portion with a sealing lip defining an  
opening in the sealing portion, in use, the sealing lip  
being pressable against a surface so that the sealing  
portion and the surface surround a testing volume which  
10 is substantially enclosed.
2. An accessory according to claim 1 wherein the  
sealing portion is arranged on a support portion.
- 15 3. An accessory according to either claim 1 or claim 2  
wherein the opening in the sealing portion is resiliently  
enlargeable.
4. An accessory according to either claim 2 or claim 3  
20 wherein the sealing portion stands up resiliently from  
the support portion and wherein the sealing portion is  
biased towards the first configuration.
5. An accessory according to any one of claims 2 to 4  
25 wherein the support portion has a window through which  
light is transmittable.
6. An accessory according to any one of claims 2 to 5  
wherein the support portion has a test gas introduction  
30 aperture.

7. An accessory according to claim 6 wherein the test gas introduction aperture includes valve means.

8. An accessory according to any one of claims 2 to 7 further including a closure portion which is releasably securable to the support portion by releasably securable means to enclose the sealing portion between the support portion and the closure portion.

9. An accessory according to claim 8 wherein, in use, the sealing portion is capable of resiliently springing from a second configuration to the first configuration on opening the closure portion from the support portion.

10. A gas detector testing accessory having a sealing portion with a sealing lip defining an opening in the sealing portion,

the sealing portion being arranged on a support portion,

the support portion having a test gas introduction aperture with resilient sealing means for prevention of substantial gas flow through the aperture,

in use, the sealing lip being pressable against a surface so that the sealing portion, the support portion and the surface surround a testing volume which is substantially enclosed.

11. An accessory according to claim 10 wherein the resilient sealing means includes a resilient material with a slit therein, the slit being resiliently biased towards a closed configuration.

12. An accessory according to claim 11 wherein the resilient material has a second slit therein, the slits thereby arranged in a cross-slit configuration.

5 13. A gas detector testing accessory according to any one of claims 10 to 12, further including any of the features of the claims 1 to 9.

10 14. A gas detector testing accessory substantially as hereinbefore described with reference to the accompanying drawings.

15 15. A gas detector testing kit having a container containing a test gas and an accessory according to any one of claims 1 to 13.

16. A method of testing a gas detector using an accessory according to any one of claims 1 to 13, a method having the steps of:

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(i) holding the sealing lip to a surface associated with the gas detector so that the sealing portion and the surface surround a testing volume which is substantially enclosed, and

25

(ii) introducing a test gas into the testing volume to test the detector.



INVESTOR IN PEOPLE

Application No: GB 0100504.0  
Claims searched: All

Examiner: Michael R. Wendt  
Date of search: 30 May 2002

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.T): G1B (BBS, BCN, BCX)

Int CI (Ed.7): G01N21, G01N27, G01N31, G01N 33/00

Other: Online: EPODOC, WPI, Japio

### Documents considered to be relevant:

| Category | Identity of document and relevant passage                                | Relevant to claims             |
|----------|--|--------------------------------|
| X        | GB 2345340 A (STONES) See whole document.                                | 1 - 3, 6, 7, 10 & 16 at least. |
| A        | GB 2269669 A (ELLIOTT) e.g. see Figure 1 & Abstract.                     |                                |
| A        | WO 90/01160 A1 (RADIOMETER) e.g. see Claim 1 & Figure 1;                 |                                |
| A        | US 4742708 (BECKMAN) e.g. see Figure 1; Abstract; Column 4 lines 18 etc. |                                |

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